

## MARINE MOLLUSKS OF HAWAII, VIII-XIII.

BY HENRY A. PILSBRY.

The description of material submitted to me for determination by Mr. D. Thaanum, Prof. Wm. A. Bryan and Mr. J. M. Ostergaard, with other forms collected by myself in 1913, is here continued. Former papers of this series were published in these PROCEEDINGS for 1917, pp. 207-230, and 309-333 (1918).

## VIII. STYLIFER, ODOSTOMIA, ACTEOCINA

One Hawaiian species, *Stylifer robustus*, was described by Mr. Pease. The Hawaiian species referred to *Scalenostoma apiculatum* Souv. in a former paper<sup>1</sup> is perhaps a *Stylifer* or closely related thereto. It is parasitic or commensal on Echinoderms. Whether it is without an operculum, like the typical *Stylifers*, has not been noted.

*Stylifer deformis* Pease, from the Paumotus, resembles both of the Hawaiian forms from the Bryan collection, without exactly matching them. A series of four *S. deformis*, including the figured type, is in the collection of the Academy. They show considerable variation in the degree and direction of curvature of the acuminate early whorls.

*Stylifer deformis hawaiiensis* n. subsp. Fig. 1a.

Honolulu Harbor, Oahu, collected by W. A. and E. J. Bryan.

The shell is thin, white. The upper fourth is acuminate, of about eight nearly flat, smooth whorls. The rest of the shell, about 6½ whorls, tapers more rapidly; the whorls increase slowly and almost regularly, and are rather strongly convex; and the surface is malleate, having many spiral facets, giving some appearance of having coarse, low, spiral threads on the last two whorls. The last whorl is well rounded basally. The aperture is ovate. Columella is slightly concave.

Length 9.2, diameter 3.2 mm.

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<sup>1</sup>Proc. A. N. S., Phila., 1917, p. 226.

Only one specimen was obtained. Its host is unknown. The shell tapers more regularly than any of the examples of *S. deformis* seen, and I am inclined to think it a distinct though closely allied subspecies.

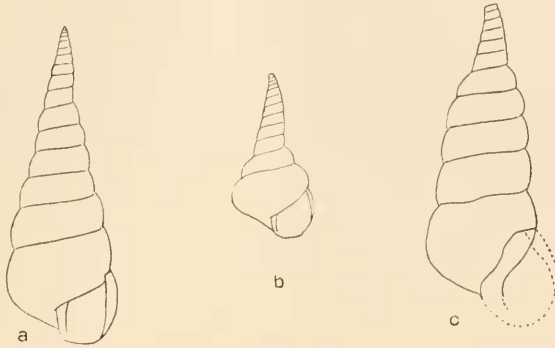


Fig. 1.—*a*, *Stylifer deformis hawaiiensis*; *b*, *c*, *S. deformis remotissimus*.

***Stylifer deformis remotissimus* n. subsp.** Fig. 1 *b*, *c*.

Pearl and Hermes Reef. Collected by Lieut. Munter.

The shell is thin, white, polished, consisting of a very narrow, slightly curved early stage of about 9 flat whorls, the shell then abruptly enlarging in the next two whorls, after which it approaches a cylindrical form, enlarging slowly to the last whorl, which is a little more dilated. The  $5\frac{1}{2}$  whorls of the second stage of growth are convex, the last whorl rounded below. The columella and parietal wall are heavily calloused.

Length 9, diameter 3.5 mm.

As the apex and last half whorl of the largest specimen are broken away, the dimensions given are estimated. A half grown cotype (fig. 1 *b*) is 4.6 mm. long.

The subcylindric shape of this species is like one of the specimens in Mr. Pease's sending of *Stylifer deformis*, but none of the latter has a heavy parietal callus. This may, however, be a character of old age.

***Stylifer mittrei* Petit.** Fig. 2 *a*, *b*.

The shell is ovate with a very small, narrow apical point, white. The attenuate initial portion consists of 4 somewhat convex whorls. It then enlarges abruptly, the 5 to 6 whorls following being quite convex, glossy, smooth, except for very faint lines of growth. The moderately impressed suture is not margined. The aperture is

ovate, outer and basal margins obtuse. The columella is weakly concave and somewhat thickened. The parietal callus is moderately thick. There is no operculum.

Length 10.6, diameter 6.75, aperture 4.8 mm.

Length 9.2 mm. Smallest adult.

Hilo, Hawaii, on the sea urchin, *Diadema*. D. Thaanum.

The apical point is more or less worn away in the adult stage. A young one, 3 mm. long, is figured showing it perfect. Mr. Thaanum writes that he did not find this *Stylifer* on any other species of sea urchin, though many others were examined.

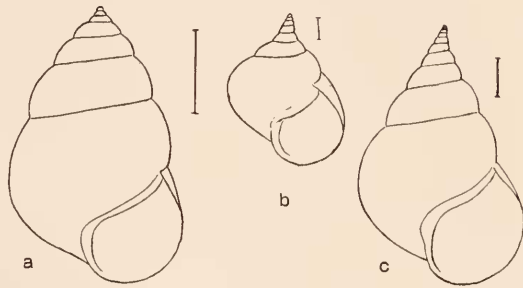


Fig. 2.—a, b, *Stylifer mittrei* Petit, adult and young; c, *Stylifer thaanumi* n. sp.

This form agrees so exactly with that described without definite locality by Petit (Journ. de Conchyl. II, p. 27, pl. 2, figs. 8, 9) that the identity can scarcely be doubted. I am inclined to think that it was a distinct species which Schepman and Nierstrasz<sup>1</sup> had under the name *Mucronalia mittrei* from Sumbawa. It was operculate, 6 mm. long, 4 wide.

*Mucronalia tumida* Pse., mentioned by Tryon as identical with *S. mittrei*, is certainly distinct from that species.

***Stylifer thaanumi* n. sp.** Fig. 2 c.

The shell is shortly ovate with slender summit, white, glossy and smooth, growth-striae being scarcely noticeable. About 5 early whorls form the slender summit, but the transition to the broad later portion of about 3 whorls is gradual. The last whorl is globose. Suture impressed, not margined. Aperture ovate. Outer and basal lips evenly curved, blunt; columella slightly concave, a little thickened. Parietal callus distinct but rather thin. There is no operculum.

<sup>1</sup>Siboga-Expedition, Parasitische Prosobranchier der Siboga-Expedition, p. 3.

Length 5.2, diameter 3.4, aperture 2.5 mm.  
 Hilo, Hawaii, on *Diadema*. D. Thaanum.  
 Often found with the preceding species.

***Stylifer robustus* Pease.**

Proc. Zool. Soc. Lond., 1860, p. 437.

"Shell globosely ovate, light, polished; finely striated longitudinally; whorls convex and marginated, last whorl swollen, sutures well impressed, inner lip slightly reflected at its junction with the columella and around the base, disappearing at about the center of the outer lip. Color white. Lives on Echini." Sandwich Islands.

This species is not contained in the Pease collection, Museum of Comparative Zoology. The description does not apply well to any specimens I have seen, and without measurements or figure it can hardly be recognized.

***Odostomia (Chrysallida) hiloensis* n. sp. Fig. 3.**

The shell is ovate-conic, solid, white, nuclear whorl smooth, convex, with inturned apex; next whorl very indistinctly plicate axially. The whorls of the spire are nearly flat. Suture channelled. Last whorl is more convex, with sculpture of spiral furrows, unequally

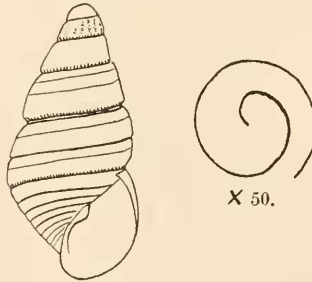


Fig. 3.—*O. hiloensis*, with outline of apex.

spaced, a deep one just below the periphery, three less impressed grooves above it, the middle one deepest; below it are 7 or 8 spirals the lower three but little impressed. The aperture is ovate, columellar plait strong.

Length 2.1, diameter 1.05, aperture 0.85 mm.;  $5\frac{1}{2}$  whorls.

Hilo, Hawaii. D. Thaanum.

Near *O. stearnsiella*, but this is smaller and differs in details of sculpture. How constant the groove patterns are in these small shells remains to be seen.



**Acteocina hawaiiensis** n. sp. Fig. 4.

The shell is minute, cylindric, white with several spiral series of gray spots. The spire is moderately raised, of very convex whorls parted by a deep suture. The initial whorl is prominent, tilted on edge, smooth; following whorl very narrow. There are three post-embryonic whorls. The last whorl is strictly cylindric, shouldered below the suture, with rather coarse wrinkles of growth. The columella is straightened above, excavated or obliquely truncate below. Outer lip arches forward.

Length 2.35, diameter 1 mm.

Off Launiupoko Camp, near Lahaina, West Maui, in 25-75 feet. Thaanum and Langford. Type 127746 A. N. S. P.

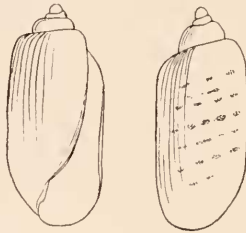


Fig. 4.—*Acteocina hawaiiensis*.

Smaller and more straightly cylindric than other known Hawaiian *Acteocinas*, further distinguished by the rather strong sculpture and the gray spots. Five series of these are seen in the type, seven in another example. They are chiefly visible on the back. All of the specimens sent are "dead" shells; one, somewhat defective, is a little larger and relatively wider than those figured.

#### IX. TEREBRA

Pease's notes on Hawaiian species may be found in Amer. Journ. Conch. IV, pp. 123-125, and V, 86. There are no examples of his *Terebra assimilis* Psc. (= *T. contigua* Psc., 1871) in the Pease collection, Museum of Comparative Zoology.

*T. swainsoni* Dh. has been discussed by Pease, who described a var. *inflexa*, to which he referred Reeve's figure 118, of *swainsoni*. I believe the figure was drawn from the latter species, of which Pease's *inflexa* becomes a synonym. It is rather common off the south coast of Oahu. It differs from *T. nitida* and *phcatella*, which are very closely allied, by having fine spiral striae in the interstitial intervals. The inner lip forms a raised ledge as in *T. nitida*. The

color ascribed to *T. swainsoni* by Deshayes and Reeve is that of faded beach shells. Twenty specimens examined, in coll. A. N. S. P. and M. C. Z.

*Terebra sulcata* Pease (Amer. Journ. Conch. V, p. 67, from Oahu) appears to be merely a small form of *swainsoni*, with stronger spiral sculpture, approaching that of *T. rosacea* somewhat. The specimens seen are No. 49967 M. C. Z., agreeing exactly with 117036 P. A. N. S., from 6-8 fathoms, off Honolulu. D. B. Langford.

Pease stated that he had 32 species of *Terebra* from the Hawaiian Islands. The following species are before me, in addition to several not determined.

*T. chlorata* Lam. Midway Island.

*T. crenulata fimbriata* Lam. Kahuku, Oahu.

*T. gouldii* Desh. Off Honolulu.

*T. inconstans* Hinds. Off Diamond Head, etc., Oahu; Molokai; Kauai.

*T. inconstans confusa* Smith. Off Halawa, Molokai.

*T. lauta* Pse. Off Honolulu; Mokapu Point, Oahu.

*T. nitida* Hinds.<sup>2</sup> Off Honolulu.

*T. nodularis* Desh.<sup>3</sup> Honolulu Harbor, Kaneohe Bay.

*T. pertusa* Born. Off Honolulu.

*T. propinqua* Pse. Off Honolulu and Waikiki.

*T. rosacea* Pse. Off Honolulu.

*T. suffusa* Pse. Off Honolulu.

*T. swainsoni* Desh. Off Honolulu.

*T. venosa* Hinds. Off Honolulu; Kauai; Maui.

*T. verreauxi* Desh. (*T. strigilata* of Born and Lamarck, not of Linné). Off Honolulu; Haena, Kauai.

#### Partial Key to Hawaiian *Terebra*.

1. No groove defining a presutural band; smooth ribbed, without spiral sculpture ..... 2
- A presutural band defined by a groove or series of pits, at least in the upper half of the shell ..... 5
2. Aperture dilated below; no canal, the emarginate base broad.
  - T. inconstans* Hinds.
  - Aperture not dilated below, the base narrow, somewhat channelled ..... 3
3. A series of dark spots on or below a whitish band at the suture.
  - T. verreauxi* Desh.

<sup>2</sup>The specimens appear to be intermediate between *nitida* Hinds and *plicatella* Desh., possibly referable to the latter.

<sup>3</sup>This is quite distinct from *T. textilis* Hinds, with which Tryon unites it.

- Spaced brown axial lines on a pale ground; ribs extending from suture to suture as far down as the penult whorl;  $38 \times 6.4$  mm. *T. lanceata oahuensis* n. subsp.
- White bands at suture and below periphery, a broad band of brown streaks or blotches above periphery, a narrow one at the base, apex purplish; ribs very fine, retracted at suture..... 4
4.  $20 \times 5$  mm.; Honolulu ..... *T. medipacifica* n. sp.  
 $28 \times 7$  mm.; Kaneohe Bay ..... *T. m. melior*, n. subsp.
5. Presutural band defined by a series of transverse pits or punctures ..... 6  
 Presutural band defined by a groove, at least on the upper half of the shell ..... 10
6. Ribs and intervals smooth ..... 7  
 Intercostal intervals below the presutural band transversely grooved ..... 21
7. Inner lip callous and raised; ribs strong ..... 9  
 Inner lip not raised ..... 8
8. Ribs straight, strong and subangular; brownish (fading to pinkish), paler below the suture..... *T. clappi* n. sp.  
 Ribs low; whitish, or with a dull purplish band. Marked with flexuous axial brown lines..... *T. venosa* Hinds.
9. A series of dark spots below the suture..... *T. lauta* Pse.  
 Color nearly uniform..... *T. nitida* Hinds.
10. Whorls flat; no sculpture except the groove..... 11  
 Whorls having other sculpture..... 12
11.  $60$  to  $75$  mm. long; maculate ..... *T. chlorata* Lam.  
 $30$  to  $35$  mm. long; pale fleshy ..... *T. suffusa* Pse.
12. Without spiral sculpture below the presutural groove ..... 13  
 Having spiral sculpture below presutural groove..... 17
13. Presutural band nodular, the later whorls elsewhere nearly smooth; large; with a few series of dark dots ..... *T. crenulata* (L.).  
 Presutural band with numerous ribs..... 14
14. Last whorl nearly smooth below the band, with 4 rows of faint spots on a whitish ground; earlier whorls ribbed; whorls shorter, less oblique than in *T. argus*.  $40 \times 8$  mm., 12 whorls. *T. argus brachygyra* n. subsp.
- All whorls ribbed ..... 15
15. Inner lip not callous; length  $60$  to over  $70$  mm. .... 16  
 Inner lip callous throughout; whitish with fleshy intercostal intervals and three faint gray spiral lines on last whorl; peristome retracted above a point at termination of sulcus. Similar to *T. cerithina* Lam., but costate throughout.  $29.5 \times 6.9$  mm., 12 whorls..... *T. spaldingi* n. sp.
16. Diameter contained about  $4\frac{2}{3}$  times in length; maculate. ....  
*T. gouldii* Desh.
- Diameter about  $4\frac{1}{2}$  times in length; no distinct pattern of color; last whorl much more convex and more contracted below than *T. gouldii*;  $60 \times 13.5$ , aperture  $14$  mm., 12 whorls remaining..... *T. thaanumi* n. sp.

17. Presutural band and surface below it axially ribbed ..... 18  
 Band and surface below it striate, not axially ribbed; band very convex, narrow, a cord and several smaller spirals below it; ochraceous-buff; long, slowly tapering; 41 x 7.9, aperture 7.2 mm.; 23 whorls. .... *T. langfordi* n. sp.
18. A tubercular cord below the presutural band, causing it to appear double ..... 19  
 No cord below the presutural band; surface with spiral grooves in the intercostal intervals ..... 19
19. Pale buff; about 27 x 5 mm. .... *T. nodularis* Desh.  
 White with three series of tawny dots on last whorl below the band; columella biplicate; a recurved basal channel; 30 x 6.7 mm., 17 whorls ..... *T. waikikiensis* n. sp.
20. Tawny, with whitish streaks on band ..... 21  
 White, with 3 series of tawny dots on the last whorl, presutural band white; below the band there are 3 or 4 spiral cords separated by deep impressions across the intercostal intervals, the upper cord widest; columella distinctly biplicate; a recurved basal channel; 30 x 6.7 mm., 17 whorls. ....  
*T. waikikiensis* n. sp.
21. Small, slender forms with raised inner lip and rather fine spiral striae in the intervals of the strong ribs ... *T. swainsoni* Dh.  
 Inner lip not raised; intervals spirally grooved ..... 22
22. Tawny, irregularly marked with whitish streaks; presutural band marked with purplish-brown between the white ribs; 50-60 mm. long ..... *T. pertusa* Born.  
 Tawny, ribs white on the presutural band; 30-35 mm. long. ....  
*T. propinqua* Pse.  
 Smaller; pale, with 3 ochraceous-buff bands; presutural ribs white, some of the intervals brownish; intercostal spirals finer, 10 on penult whorl, aperture somewhat channelled and yellow below. 25 x 5.5, aperture 5.3 mm.; 15 whorls. Maui and Oahu ..... *T. flavofasciata* n. sp.  
 Small, length about 20 mm.; roseate and whitish, without distinct pattern ..... *T. rosacea* Pse.

**Terebra langfordi** n. sp. Pl. XII, fig. 5.

A long, slowly tapering species similar to *T. straminea* in appearance; light ochraceous buff in color. The whorls are short, presutural fasciole a strong cord, its upper slope somewhat grooved; below it a much smaller cord followed by four (rarely three) unequal spirals, traversed by unequal arcuate incremental striae, Base of the last whorl with numerous smaller spirals. The aperture is small, with strongly oblique anterior canal. Columella short, smooth.

Length 41, diameter 7.8, aperture 7.2 mm.; 23 whorls.

Length 50, diameter 9, aperture 8.2 mm., 21 whorls, apex broken

Off Honolulu in 6 to 8 fms. D. B. Langford.

In *T. straminea* the presutural band and the cord following it are obliquely costulate, the presutural band flattened. Otherwise it is much like the present species. *T. funiculata* Hinds is more closely related. It is decidedly more slender than *T. langfordi*, with more spiral threads, one at the periphery more prominent.

A form of which I found a single specimen on the dredger dump at Honolulu is much more slender. The groove dividing the sutural band is deeper, and there are but three spiral cords below the one accompanying the band. In the small number of spirals it differs from *T. funiculata*. This form may be called *T. langfordi angustior* (Pl. XII, fig. 6.)

Length 29, diameter 5, aperture 4.5 mm.; 20 whorls remaining.

I at first thought this form was *T. sculptus* Pease, but that is described as having a conspicuous nodose rib.

The spiral sculpture is much more pronounced than in *T. laevigata* Gray.

***Terebra argus brachygyra*** n. subsp. Pl. XII, fig. 4.

The shell is smaller than *T. argus* with shorter, less oblique whorls; the sculpture of low ribs cut by an irregularly punctured spiral sulcus is stronger, and visible down to the penult or even on the last whorl. The pattern of three series of squarish pale buff spots on an almost white ground is very indistinct.

Length 40, diameter 8 mm., 12 whorls remaining, the apex broken.

Length 39, diameter 8.7 mm., 12 whorls remaining.

Off Honolulu, 3 to 8 fms. D. Thaanum.

***Terebra peasei*** Desh.

This species of the section *Strotocerebrum* has been considered a synonym of *T. puncticulata* by Reeve. Pease (Amer. Journ. Conch. V, p. 64) concurs in this synonymy. The locality of *T. puncticulata* was unknown. The description agrees well with the Hawaiian species except for the phrase "*plicis regularibus, depressis. latis, obtusis*" and the statement that the whorls are "*subaequaliter divisus*" by the presutural line.

In the Hawaiian shell the folds could not be called wide, and the division of the whorls is well above the middle.

Reeve's figure of *T. puncticulata* evidently represents the type of *T. peasei*, agreeing with that, and not with *puncticulata*, in measurements.

Under the circumstances it appears safer to call the Hawaiian form (which has been taken by Langford off Honolulu in 6 to 8 fathoms) *T. peasei* Desh. Two lots from Pease are in the collection of the Academy.

*Terebra flavescens* Desh. (P. Z. S. 1859, p. 299; Reeve, C. Icon. XII, pl. 14, fig. 59) does not appear to differ much from *T. peasei* Desh., except that the axial ribs are arcuate. I have not seen it. Locality, Sandwich Islands, Cuming coll.

***Terebra thaanumi*** n. sp. Pl. XII, figs. 1, 2.

A shell resembling *T. gouldii* Desh.; the whorls shorter than in that species, especially the last whorl, which is much more convex; aperture shorter. It is pinkish buff with ill-defined streaks of cinnamon or russet. The sides are straight. The suture and the furrow defining the presutural fasciole are subequal, deeply impressed, the surface narrowly shouldered, subangular below both. The presutural band occupies somewhat more than one-third of each whorl. Sculpture of smooth ribs equal to their intervals, about 30 on the penult whorl. No interstitial spiral sculpture. The last whorl contracts abruptly below, the base well rounded, separated from the siphonal fasciole by a furrow bounded below by a sharp ridge. The aperture is subtrapezoidal. Columella straight, obliquely truncate.

Length 60, diameter 13.5, aperture 14 mm.; 12 whorls, the apex broken. Type.

Length 51, diameter 10.7, aperture 12.3 mm.; 18 whorls, apex perfect.

Off Honolulu in 6 to 8 fms. D. B. Langford. Also off Waikiki in 25 to 50 fms.

By conchological criteria this would probably belong to *Duplicaria*; yet until the teeth of many more species of *Terebra* are examined, no classification of the species has much value.

***Terebra waikikiensis*** n. sp. Pl. XII, fig. 12.

The shell is slender, slowly tapering, white, with three spiral series of chestnut dots on the last, two on the preceding whorls; these dots are also in vertical series, of which there are about 8 on the last whorl. Sculpture of rounded axial ribs equal to their intervals, about 21 on the last whorl. The ribs are deeply sinuated by the presutural groove, which is rather deep between them, and defines a wide presutural band. Below the groove there are three or four furrows across each intercostal interval, and above, near the suture there is one such furrow. The last whorl is convex with numerous spiral



cords. Aperture small, the anterior canal recurved. The columella is biphlicate within.

Length 30, diameter, 6.7, aperture 6 mm.; 17 whorls.

Off Waikiki, Oahu, in 25 to 50 fms. D. B. Langford.

In form and color somewhat like *T. decorata* Desh. (Proc. Zool. Soc. 1859, p. 314, no. 214), which is said by Reeve to be identical with *T. tessellata* Gray (P. Z. S. 1834, p. 61); but that species is entirely distinct in sculpture.

***Terebra flavofasciata*** n. sp. Pl. XII, fig. 3.

Shell shaped like *T. propinqua* Pse.; white, part of the intercostal spaces of the presutural band marked with vinaceous russet; 3 ochraceous-buff bands, one below the sutural band, another narrow, at the periphery, and the third occupying the base. Sculpture of smooth, rounded axial ribs, slightly wider than their intervals, 19 on the last whorl of the type, 25 mm. long, (16 in a shell 17 mm. long). The intercostal intervals have many spiral cords wider than their interstices, 10 on the penult whorl, below a series of deeper transverse pits defining the presutural band. Upon the band the interstitial spirals are finer. On the base the ribs become obsolete and there are coarser spiral cords. Aperture rhombic, somewhat channelled and yellow at the base.

Length 25, diameter 5.5, aperture 5.3 mm.; 15 whorls.

Off Launiupoko camp, West Maui; small specimens, 17-18 mm. long, off Honolulu, 6 to 8 fms. D. Thaanum and D. B. Langford.

Smaller than *T. propinqua* and *T. pertura*, with more numerous spirals and different coloration. Possibly to be compared with *T. sulcata* Pease (Amer. Journ. Conch., V, 67), the type of which is lost.

***Terebra clappi*** n. sp.

The shell is slender, shaped about as in *T. nitida*, glossy, dark vinaceous brown, the ribs and an ill-defined belt below the suture paler or whitish. Whorls nearly flat, with well-impressed suture, the last whorl contracting downward. Sculpture of straight, angular ribs, rather suddenly terminating at the base, the intervals having a spiral series of impressions defining an infrasutural band; these impressions sometimes nicking the summits of the ribs slightly. In the type there are 15 ribs on the last whorl. The aperture is a little dilated below. Columella one-folded.

Length 17.5, diameter 3.8, aperture 4.2 mm. 11 post-embryonic whorls.

Length, 21, diameter 4.5 mm., 13 post-embryonic whorls. Honolulu, Pease Coll., M. C. Z., 49964.

Off Mt. Lihau, West Maui, 25-75 feet., D. Thaanum. Also off Honolulu, 35-50 feet., D. B. Langford.

This species differs from *T. nitida* by the absence of a raised inner lip, though it is often somewhat calloused. It is much like *T. swainsoni*, as I have identified that species, but lacks the interstitial sculpture and the raised inner lip of that species. Seventeen specimens in coll. A. N. S. P. and M. C. Z.

It appears to be what Pease identified as *T. swainsoni* Desh., but that is described as having the early whorls transversely striate.

It is named for Mr. Wm. F. Clapp, who has kindly assisted in the examination of Pease's species.

***Terebra lanceata oahuensis*** n. subsp. Pl. XII, fig. 7.

The shell is rather smaller than *lanceata* and for at least half of its length the ribs extend entirely across the whorls; on the later whorls they shorten, but are visible below the suture on the last. The pattern of brown lines, interrupted or bent at the periphery, is similar to that of *lanceata*.

Length 38, diameter 6.4 mm.

Off Honolulu, 6 to 8 fathoms. D. B. Langford.

Dr. Dall (Bull. M. C. Z., 43, p. 249), has formed a subgenus *Acumima* for *Terebra lanceata* (Linné); but that species is conchologically close to *T. strigilata* of Born and Lamarek, and would seem to belong to *Hastula*.

***Terebra verreauxi*** Desh.

Journ. de Conchyl., II, 1857, p. 95, pl. 5, fig. 3.

Exactly what species was intended by *Buccinum strigilatum* Linné (Syst. Nat. X, p. 741; Hanley, Ipsa Linn. Conch. p. 261) is not known. As Hanley remarked, the identification of Born has been generally accepted.<sup>4</sup> He states that the shell in Linne's cabinet is *T. concinna* Desh.

For the Hawaiian form we prefer to use the name given by Deshayes, whose description and figure represent this form. It is one of the most beautiful of the genus. The color is from deep olive to ecru-olive or more ochraceous, with white bands at suture and below periphery, the former decorated with regular black-brown spots. It has been taken off Honolulu, 6-8 fms (D. B. Langford), and at Haena, Kauai (Bryan).

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<sup>4</sup>Also by Melvill and Standen in their revision of Persian Gulf Terebridae, Journ. of Conch., XV, 212.



***Terebra medipacifica*** n. sp. Pl. XII, figs. 8, 9, 10.

Shell rather slender with slightly convex lateral outlines; a white band below the suture, followed by a broad band of brown streaks and blotches on a white ground, extending to the periphery. A second white band below the periphery and a narrow band of brown markings just above the narrow, rather shallow furrow between base and siphonal fasciole; apical whorls purplish. Sculpture of fine, forwardly curved axial ribs, about 35 on the last whorl. Both ribs and intervals are smooth, there being no spiral sculpture. There are about  $4\frac{1}{2}$  smooth embryonic whorls, the last bulging, wider than the following sculptured whorl;  $8\frac{1}{2}$  sculptured whorls. Suture is regularly crenulated by the ends of the ribs. The aperture is narrow, channelled above by the retraction of the lip near its insertion. Anteriorly it is broadly notched. Columella smooth. There is no raised inner lip, though the parietal callus is rather thick.

Length 18.8, diameter 4.4, aperture 5.4 mm.

Length 20, diameter 5, aperture 6 mm.

Off Honolulu, 6 to 8 fathoms. D. B. Langford.

It is much more finely ribbed than *T. inconstans*, with a differently shaped aperture. *T. bipartita* Desh. (Proc. Zool. Soc. London, 1859, p. 284), from the Isles Sandwich, requires comparison, but the description does not agree fully, and the species has not been figured.

It is one of the species which Reeve and Tryon would have placed under *T. hastata*.

***Terebra medipacifica melior*** n. subsp. Pl. XII, fig. 11.

A much larger form of this species was taken in Kanohohe Bay, Oahu. The brown markings are much reduced, but not more than in some Honolulu shells. There are 38 ribs on the last whorl.

Length 28, diameter 7, length aperture 8 mm.; 10 post-embryonic whorls.

***Terebra spaldingi*** n. sp. Pl. XII, fig. 13.

Shell narrow, polished; whitish, the intercostal intervals flesh colored; three faint gray spiral lines on the last whorl, the upper one visible on the spire.

Sculpture of smooth, rounded axial ribs, about 22 on the last or penult whorls, a little prominent just below the suture, interrupted by a well impressed presutural groove; intervals smooth. Last whorl with a spiral ridge bounding a narrow basal furrow, which extends also above the narrowly reflected basal margin. The aper-

ture is rather wide below, posteriorly channelled, the outer lip retracted a little above. Inner lip calloused, a little elevated. No columellar fold.

Length 29.5, diameter 6.9, aperture 7.5 mm. Twelve whorls.

Off Honolulu, 6 to 8 fathoms. D. B. Langford.

A form from Kancohe Bay in 4 fathoms is much larger, length 37.3, diameter 9 mm.

This species is closely related to *T. cerithina* Lam., but differs in having all of the whorls ribbed. The Honolulu specimens are stained with iron. *T. affinis* Gray differs by the interstitial sculpture.

***Terebra dussumieri hiradoensis* n. subsp.**

The shell is similar to *T. dussumieri* in form, but differs by the smaller number of longitudinal ribs, which are wider and more widely spaced, about 17 on the penult whorl.

Length 55, diameter 11 mm.

Hirado, Hizen, Japan. Type 81994, A. N. S. P.

## X. MITRA AND VEXILLUM

W. H. Pease described several forms about which little is known. His notes on various Hawaiian species were published in the American Journal of Conchology, III, pp. 212-215, 233, 271; IV, pp. 119-121; V, 85.

*Mitra mitra* (L.) (*Voluta mitra episcopalis* L.) has been taken in the material dredged from Honolulu Harbor, but no specimens are at hand for comparison with those of other localities.

### *Partial Key to Hawaiian Species of Mitra and Vexillum.*

- I. MITRA. Shell smooth, finely striate, or with spiral punctured lines; throat not lirate.
1. Shell with spiral series of spots on a light ground ..... 2  
 Shell uniform or otherwise marked ..... 3
  2. Six spiral series of orange spots; large, the last whorl smooth.  
*M. mitra* (L.).  
 Three irregular series of brown (tawny) spots; finely striate spirally throughout; outer lip thin near the upper insertion, elsewhere rather thick and smooth, a low swelling behind it. 6 plaits; base recurved. Aperture longer than in *M. ustulata* Rve.; 50 x 15, aperture 26 mm. ....  
*M. kamehameha* n. sp.
  3. Suture crenulated by a series of white tubercles ..... 4  
 Suture even or nearly so ..... 6

4. Weakly, irregularly plicate, with coarse punctures in spiral and axial series ..... 5  
 Not plicate; fine punctures in spiral series, often obsolete at periphery; a ragged or blotched white band near the suture and usually other white spots, on a dark ground. ....  
*M. coronata aurora* Dohrn.
5. Chocolate, with a white band bordering the suture. ....  
*M. lugubris* Sw.  
 A narrow whitish band a short distance below the suture, white sutural tubercles. Honolulu. ....  
*M. lugubris honoluluensis* n. subsp.
6. Spire and upper part of last whorl finely axially costulate, with spiral punctured lines ..... 7  
 Spire spirally striate, not distinctly costulate ..... 9
7. Aperture  $\frac{2}{3}$  or more of the total length; spire short; yellow (or white) with dark apex and basal spot ..... 8  
 Aperture less than  $\frac{2}{3}$  of the length, spire moderately long; white with a dark brown median belt ..... *M. newcombi* Pse.
8. Last whorl sculptured only at the upper part. ....  
*M. olivaeformis* Sw.  
 Last whorl having spaced, closely punctate spiral lines throughout, otherwise similar to the preceding. ....  
*M. olivellaeformis* n. sp.
9. Fusiform, the aperture half the length or less ..... 10  
 Pupiform, with shorter spire and longer aperture ..... 14
10. Small species, less than 18 mm. long ..... 12  
 Larger or large species, about 20-50 mm. long ..... 13
12. White, smooth, with two wide orange zones; about 14 mm. long ..... *M. micans* Rve.  
 White; minutely striate spirally, 7-8 mm. long. ....  
*M. alba* Pse.
13. Uniform cinnamon-brown; outlines rather straight above and below the convex periphery; sculpture of punctate spiral lines, 8 on penult whorl, weaker in the peripheral region; outer lip contracting above, with crenulate edge, but without any internal tubercle or callus; 6 plaits. 51 x 19, aperture 24.4 mm., 8 whorls ..... *M. thaanumiana* n. sp.  
 Similar to the preceding, but the last whorl is somewhat flattened peripherally; there are 6 punctured lines on penult whorl; irregular crenulations below the suture; 5 plaits. 43 x 15, aperture 22.3 mm. Orange (faded); Honolulu. ....  
*M. ostergaardi* n. sp.  
 Olivaceous or dusky, with widely spaced dark spiral lines; outer lip thickened or with a tubercle within. ....  
*M. astricta* Rve.
14. Speckled with buff on a dark ground ..... *M. litterata* Lam.  
 Chocolate, with a pale shoulder band ..... *M. auriculoides* Rve.  
 Uniform dark brown ..... 15

15. A callous projection within the outer lip in adult shells, none in the throat; peripheral region convex; 5 well developed plaits ..... *M. brunnea* Pse.  
 No lip callus; a nodule in the throat; carob brown to chestnut brown, the aperture chocolate; last whorl somewhat cylindrical, smooth with spirals at the base; 4 plaits. 25 x 10.4, aperture 14 mm. .... *M. ticaonica vagans* n. subsp.
- II. Shell conspicuously spirally lirate, axial sculpture subordinate or wanting; outer lip blunt or thin, crenulate, throat smooth.
1. Diameter nearly half the length; with smooth spiral cords, very little interstitial sculpture ..... 2  
 Shell more slender, with distinct interstitial sculpture ..... 4
2. Shell irregularly plicate axially; very pale with a thin brown epidermis ..... *M. turgida* Rve.  
 Shell not plicate ..... 3
3. Orange, often with white peripheral maculation. .... *M. tabanula* Lam.  
 Thin, fulvous ..... *M. subrostrata* Sowb.  
 Brown with some white maculation ..... *M. proscissa* Rve.  
 White, variegated with smoky brown ..... *M. pudica* Pse.
4. Interlirial spaces with an intermediate thread and close axial sculpture leaving narrow pits ..... *M. interlirata* Rve.  
 Having close low riblets, making the cords tubercular; 11 cords on last whorl; yellowish with 2 indistinct brown bands, tubercles white; 3 columellar plaits. 11.6 x 4.5, aperture 6.3 mm. .... *M. waikikiensis* n. sp.  
 Having spaced axial impressed lines throughout; apex pink; 4 or 5 plaits.
5. Spirals narrow, brown on a white ground; smaller than *M. granatina* Lam., the brown lines continuous; 35.3 x 11.4, aperture 18 mm.; 8 post-embryonic whorls; Honolulu. .... *M. langfordi* n. sp.  
 Spirals blunt, alternately larger and smaller; buff with a broad chestnut peripheral band, its upper half interrupted into a series of large spots; 29.3 x 9.3, aperture 16.4 mm.; 7½ post-embryonic whorls; near *crenifera* Lam., but smaller with many more impressed axial lines ..... *M. emersoni* n. sp.
- III. VEXILLUM. Axial ribs predominating over spiral sculpture when the latter is present. (In *baldwini* the later whorls are smooth.)
1. Shell obesely fusiform, with narrow aperture; outer lip conspicuously receding or excised below, lirate within, a plait at its upper third; 5 or 6 plaits (Section *Idiochila*, new) ..... 2  
 Outer lip normal, not receding below ..... 3
2. Last 3 or 4 whorls very smooth and glossy, marbled or streaked; early whorls costulate ..... *V. baldwini* Melv.<sup>5</sup>

<sup>5</sup>*V. baldwini* has been collected at Honolulu by Ostergaard and Bryan. It may prove to be identical with *V. flammulata* Pse., of which I have not seen specimens. *V. baldwini* and *V. turben* form a peculiar section to be called *Idiochila*, the type being *V. turben* Reeve.

- Later whorls with many fine ribs, intervals spirally grooved; clear yellow. 22.7 x 12 mm. .... *V. turben kanaka* n. subsp.
3. Rather short species with about 15 or fewer axial folds on the last whorl ..... 4  
 Having more numerous axial folds or ribs ..... 7
4. Stout shells with strongly coronate whorls and coarse spirals ..... 5  
 Whorls axially plicate, not coronate, with very fine, close spiral striation ..... 6
5. Spiral cords strong; no lirae in the throat *V. tuberosa* (Rve.).  
 Spiral cords less strong; throat lirate. ....  
*V. patriarchialis* (Gmel.).  
 6. 12 x 7 mm. to 18 x 8 mm. .... *V. dermestina* (Lam.).  
 About 9 x 3.7 mm.; white with brown lineolation. ....  
*V. nodulosa* (Pse.).
7. Small axial ribs in some of the intervals of the larger. ....  
*V. bella* (Pse.).  
 Axial ribs about equal ..... 8
8. A finely striate depression in the ribs a short distance below the suture; small, chocolate-colored, with the upper surface maculate with white ..... *V. tusa* (Rve.).  
 Without such depression or coloration ..... 9
9. Spiral cords running over the axial ribs ..... 10  
 Spiral sculpture appearing as transverse grooves in the intervals only ..... 13
10. Whitish, with pale markings; stippled lirae in the throat ..... 11  
 Marked with tawny or brown; stout in form; continuous threads in the throat ..... 12
11. Subtubercular and angular close below the suture; a faint fleshy band with sparse brown dots on the ribs. ....  
*V. wisemani* (Dhm.).  
 Third spiral below suture slightly prominent; base pale vinaceous ..... *V. compta* (Ad.)
12. Axial ribs rather coarse, continuous; many fulvous spiral bands; 18-20 mm. long ..... *V. aureolata* (Sw.).  
 Axial ribs very fine, cut by spiral grooves; tawny or brown with a white band and base; about 9 mm. long. ....  
*V. picca* (Pse.).
13. Minute species, less than 10 mm. long; dark-colored ..... 14  
 Larger shells, over 15 mm. long ..... 15
14. Chocolate, sometimes with a white band; about 8 x 3 mm. ....  
*V. mica* (Rve.).  
 Fusiform, vinaceous-tawny, with burnt umber bands at periphery and base; about 30 rounded axial ribs on last whorl, intervals with wide, low, spiral cords separated by impressed lines, 4 on penult whorl; 4 plaits; 6.5 x 2.7, aperture 3 mm.; 5½ post-embryonic whorls ... *V. micra* n. sp.
15. Fusiform, white with a cinnamon band below periphery; at periphery are narrow brownish spots between the ribs,

surmounted by a cinnamon line; 11 rounded ribs on the last whorl, intervals with transverse impressions, 10 or 11 in intervals on penult whorl; 5 plaits, 25.3 x 8, aperture 12 mm.; 10 whorls ..... *V. thaanumi* n. sp.

Fusiform, white with a chestnut band below the periphery and few blackish-brown spots below the suture, apex dark brown, 22 smooth axial ribs on last whorl with short, transverse impressions in the intervals, 6 in each interval on penult whorl; 2 spiral cords more prominent at base; 5 thin plaits. 18 x 7.5, aperture 8.4 mm.; 10 whorls.....  
*V. xenium* n. sp.

**Mitra kamehameha** n. sp. Pl. XII, fig. 23.

The shell is slender, fusiform, finely striate spirally. White, with three series of ochaceous orange spots, subsutural, peripheral and basal, the former with few spots. On the spire these spots are more or less concreescent into longitudinal stripes.

The last whorl has a broad swelling behind the outer lip. The aperture is more than half the total length, narrow. Outer lip is rather thick, excavated within and becoming quite thin near the upper insertion. There are six plaits, the lower ones small.

Length 50, diameter 15, aperture 26 mm. Type.

Length 40, diameter 12.7, aperture 22 mm.

Honolulu Harbor, in the dredger dump. J. M. Ostergaard.

This species is related to *M. ustulata* Rve., but it differs by having the aperture longer, more than half the total length, while in *ustulata* it is less than half. The color is doubtless darker in living specimens.

**Mitra thaanumiana** n. sp. Pl. XII, fig. 21.

The shell is solid, fusiform. Outlines of spire and basal part straight, periphery convex; cinnamon-brown, where the thin cuticle is lacking, sayal brown, the apical whorls paler. Sculpture of fine, well-spaced spiral striae marked with series of small punctures, and separated by flat intervals; on the back of the penult whorl there are 8 such spirals. The basal third of the last whorl has coarser, deeper spirals and punctures, with convex intervals. The aperture is clouded with cinnamon within. It is widest in the lower part, the lip being straight and abruptly contracted above. There are six white plaits.

Length 51, diameter 19, aperture 24.4 mm. Eight whorls (the apex worn.)

Hilo, Hawaii, D. Thaanum.



**Mitra ostergaardi** n. sp. Pl. XII, fig. 22.

The shell is fusiform with conic spire somewhat flattened periphery, somewhat convexly tapering base, slightly concave below; ochraceous-buff to nearly as dark as ochraceous-orange, the spire usually a little paler. Sculpture of widely-spaced spiral series of small punctures, six on the back of penult whorl, the intervals very minutely, superficially striate spirally; towards the base having punctured spiral grooves. Under the suture the whorls are a little prominent and finely, irregularly crenulate.

The aperture is flesh-tinted within; narrow, but slightly wider below; lip contracted above. Five plaits.

Length 43, diameter 15, length aperture 22.3 mm. (summit broken).

Honolulu Harbor, in the dredger dump. J. M. Ostergaard.

The color is altered, as in nearly all shells from the "dump," in life it will be found to be much darker in color. It is closely related to *M. thaanumiana*, but the last whorl is decidedly more cylindrical, and there are fewer spiral puncture lines.

Two of the three specimens show a very faint pale line at the shoulder. Some young shells which are perhaps this species have a distinct whitish line at the shoulder, They have 4 columellar plaits.

**Mitra coronata aurora** Dohrn.

Faded specimens are found in the dump of the Honolulu Harbor dredge. Also taken alive in 150-300 feet off Waikiki by D. B. Langford. Mr. Thaanum collected beautiful living ones at Keekea, Hilo, Hawaii.

**Mitra lugubris** Swains.

Honolulu Harbor; off Waikiki, 35-50 fms.

**Mitra lugubris honoluluensis** n. subsp. Pl. XII, fig. 16.

Similar to *M. lugubris* in the deep punctures and longitudinal wrinkles, but having small, white subsutural tubercles and a narrow white band a short distance below the suture.

Length 23, diameter 9.7 mm.

Honolu'u Harbor.

**Mitra (Strigatella) ticaonica vagans** n. subsp. Pl. XII, figs. 14, 15.

The shell is oblong, solid. Chestnut-brown. Spire short, with sculpture of five impressed spiral lines. Last whorl smooth except at the base, where there are about 10 spiral furrows.

The aperture is long and narrow, dark brown within, the outer lip contracted above, having a deeply placed median fold in the throat. Columellar plaits whitish, four, sometimes with a short tubercle between the first and second.

Length 25, diameter 10.4, length of aperture 14 mm.

Length 22.5, diameter 10, length of aperture 12.3 mm.

Hilo, Hawaii. D. Thaanum. Also collected on the Honolulu Harbor dump in considerable quantity by Prof. Wm. A. Bryan several years ago, and by the writer in 1913.

Hawaiian examples have the spire less deeply grooved, and the last whorl more extensively smooth than *M. ticaonica* Reeve of the Philippines. They appear to be worthy of varietal separation.

*Strigatella fuscescens* Psc. (Proc. Zool. Soc., 1860, p. 146; Amer. Journ. Conch., III, 233) differs by the white aperture and 5-plaited columella.

The Honolulu specimens have faded to a tawny or ochraceous buff tint. The largest measures, length 31, diameter 11.3, aperture 15 mm. (fig. 14).

**Mitra olivellaeformis** n. sp.

The shell is similar to *M. olivaeformis* Sw. except that it is more slender, and the entire last whorl is provided with impressed, punctured spirals, about 13 on the last whorl.

Length 11.2, diameter 4.7 mm. Type, Niihau.

Length 15, diameter 5.6 mm. Viti Islands.

Niihau. Type 67779 A. N. S. P.

The typical *M. olivaeformis* Swains.<sup>6</sup> has two or three puncture series about the summit of the last whorl. It has been found in Honolulu Harbor by Prof. W. A. Bryan, who gave me a specimen.

**Mitra langfordi** n. sp. Pl. XII, fig. 20.

Closely related to *M. granatina* Lam. (*M. scabriuscula* L., of Reeve and Tryon), but constantly smaller, with smaller secondary spirals and several fine striae in the intervals between major spirals; of the latter there are five on the penult whorl, with a smaller one above, near the suture; the brown lines of these spirals are continuous or nearly so (while in *granatina* they are much interrupted). Columella with four or five plaits. The embryonic stage, of about 3 whorls, is smooth and pink.

Length 35.3, diameter 11.4, length of aperture 18 mm; 8 post-embryonic whorls.

<sup>6</sup>Zoological Illustrations II, second series, 1831, Mitranæ, pl. 6, fig. 3.



Off Honolulu, D. B. Langford.

The shell is less elongate than *M. gracilis* Reeve, and is more closely related to *M. granatina* than to the *M. filosa* complex.

*Voluta filaris* L. (Mantissa p. 548, 1771) is not positively identified, though the opinion of Hanley that it is identified with *M. filosa* Lam. (not Born), (Kiener's pl. 5, figs. 12), seems probable.

*M. filosa* Born (+ *M. nexilis* Martyn) and *M. bernardiana* Phil. appear to be distinct and valid species. *M. circula* Kiener ("circulata" of Reeve and Tryon) is also quite distinct. None of these has been taken in Hawaiian waters so far as I know.

**Mitra emersoni** n. sp. Pl. XII, fig. 19.

A species closely related to *M. crenifer* Lam.;<sup>7</sup> smaller; the vertical impressed lines about twice as far apart.

The shell is buff with a broad, irregular peripheral band of chestnut, its upper half interrupted into a series of large spots; also an indistinct, brown band composed of spots and dashes at the base.

Sculpture of alternately smaller and larger spirals and well-spaced, vertical, impressed lines. Four plaits. Embryonic shell pinkish.

Length 29.3, diameter 9.3, aperture 16.4 mm. Seven and one-half post-embryonic whorls.

Off Honolulu. D. B. Langford.

Named in honor of Mr. Joseph Emerson of Honolulu.

*Mitra pallida* Pse. (Proc Zool Soc. London, 1860, p. 146) has not been described with sufficient detail for recognition.

**Mitra waikikiensis** n. sp. Pl. XII, fig. 17.

The shell is fusiform, pale brown with ill-defined darker peripheral and basal bands and white tubercles. Sculpture of spiral cords (eleven on the last whorl behind the lip) and lower longitudinal ribs, producing tubercles where they cross the cords. Aperture white. Columella with three plaits, the upper large, the lower quite small.

Length 12.5, diameter 4.8, length of aperture 6.7 mm.

Length 11.6, diameter 4.5, length of aperture 6.3 mm.

Off Waikiki, Oahu, in 35-50 fms. D. B. Langford.

**Vexillum thaanumi** n. sp. Pl. XII, fig. 31.

The shell is fusiform, rather slender, white, with a cinnamon band below the periphery. At the periphery there are narrow vin-

<sup>7</sup>Which perhaps = *M. clathrus* (Gmelin), but the figure of that is very unsatisfactory.

aceous or brownish spots between the ribs, surmounted by a continuous, cinnamon line. On the penult whorl this line is median.

Sculpture of vertical ribs weakening towards the base, the intervals with short impressed lines in a spiral direction; on the last whorl there are 11 ribs and about 19 spirals, exclusive of those on the siphonal fasciole. On the penult whorl there are 10 or 11 impressions in an interval.

The aperture is slightly pink tinted within, lirate in the throat. Five columellar plaits, the lower one very small.

Length 25.3, diameter 8, aperture 12 mm.; 10 whorls.

Off Waikiki, Oahu, in 200-300 feet. D. B. Langford.

*Mita interstriata* Sowerby (Thes. Conch. fig. 392) resembles this species somewhat in color, but it is wider, contracted more above the more prominent siphonal fasciole, and has a wider aperture.

**Vexillum xenium** n. sp. Pl. XII, fig. 25.

The shell is fusiform, white with a chestnut band traversed by several paler spiral lines, below the periphery, two or three paler interrupted lines above it on the summits of the ribs only, and a few widely spaced blackish-brown spots below the suture, on the ends of some of the ribs. The first three whorls are also deep brown. Sculpture of smooth, longitudinal ribs, 22 on the last whorl, equal to their interstices, the latter marked with short impressions in spiral series, 6 on the penult whorl in each interval; base spirally grooved over ribs and intervals forming about 4 spiral series of tubercles. Two obliquely spiral cords are more prominent just above the siphonal fasciole. Aperture shorter than the spire, the throat with 9 thin beaded lirae. Columella with 5 thin plaits.

Length 18, diameter 7.5, aperture 8.4 mm., 10 whorls.

Off Waikiki, Oahu, 25-50 fms. D. B. Langford.

*Turricula approxima* Pease (P. Z. S. 1860, p. 146) is described as convexly angulated at the sutures and with 4 plaits; it seems therefore to be a different species.

**Vexillum micra** n. sp.

The shell is fusiform, vinaceous tawny with a band at the periphery and another on the base of burnt umber. Sculpture of many vertical rounded ribs, about 30 on the last whorl, the intervals with wide, low spiral cords separated by impressed lines, of which there are 4 on the penult whorl; base with spiral cords. Aperture colored like the outside. Columella with four plaits. The embryonic shell is long-conic, of about  $3\frac{1}{2}$  smooth whorls.

Length 6.5, diameter 2.7, aperture 3 mm.;  $5\frac{1}{2}$  post-embryonic whorls.

Off Waikiki, Oahu, in 25-50 fms. D. B. Langford.

One specimen is a little stouter and lacks the lower brown band.

**Vexillum turben kanaka** n. subsp. Pl. XII, fig. 26.

The shell is similar to *M. turben* Reeve (Philippine Islands) in sculpture and the ochraceous-buff or buff-yellow color, but the spire is more shortly and a little concavely conic above, the penult whorl slightly swollen. There are six plaits, the upper one strong and horizontal. Within the outer lip there is a small fold, more prominent than the others about the upper third.

Length 22.7, diameter 12 mm.

Length, 21, diameter 10 mm.

Honolulu, on the dredge dump, J. M. Ostergaard.

Three specimens of this exquisite shell have been taken. On comparison with a specimen of Reeve's species they show certain differences of shape which seem to be of racial significance.

The related *M. baldwini* Melvill is very different in color and sculpture. It should be compared with *T. flammulata* Pease, which may be the same.

## XII. VARIOUS OTHER GASTROPODS

**Murex pele** Pilsby. Pl. XII, figs. 29, 30.

*Murex pele* Pils., Nautilus XXXI, pl. 3, figs. 9, 12.

Off Waikiki, Oahu, in 35-50 fathoms. D. B. Kuhns, 1916. Type no. 47191 A. N. S. P. Also in the Thaanum collection.

Closely related to *M. rota*, which it resembles in general form. Pure white. The nuclear whorls are lost. The first  $2\frac{1}{2}$  remaining whorls form a slender, slowly tapering style, the whorls being nearly flat, the suture oblique, well impressed, bridged by a few laminae. After that the shell enlarges abruptly; the next  $1\frac{1}{2}$  whorls being carinate, flattened above the keel, very deeply excavated below it, crossed by six lamellar founced varices on a whorl. The last whorl is rounded with several quite low spiral welts. The six varices, which increase progressively and rapidly in prominence, are connected by broad lamellae with the preceding whorl, dividing the sutural region into a series of deep cavities. The varices bear long spines, blunt or expanded at the ends, crenulated on the back and sides, slit in front. There are two of these processes on each varix much larger than the others, more expanded at the ends. A series of little

foliations stands at the front bases of the large processes. The aperture is small, oval. The long anterior canal is nearly or quite closed.

Length 31, diameter, including spines 18.5 mm. Type, fig. 29.

Length 40, diameter, including spines, 30 mm.

The operculum is Purpuroid, the nucleus lateral. It has external sculpture of concentric laminae, which are prominent and crimped in the outer and basal parts, subobsolete in the median and inner portions, which are nearly smooth, or merely wrinkled.

Compared with *M. rota* Sowb., this species differs by having fewer enlarged spines. *M. rota* has four or five subequal ones on the last varix, of which at least three radiate from the aperture like the spokes of a wheel, and one is on the canal. In *M. pele* there are only two enlarged processes. Other characters of the two species appear to be much alike, though in the old specimens of *M. rota*, which alone are at hand for comparison, the whorls of the spire are worn, and the earlier ones lost. It attains a greater size than the Hawaiian species.

The largest individual of *M. pele* found (Pl. XII fig. 30) is evidently quite old. It is much encrusted. The quite clean one selected for description (fig. 29) is probably nearly a whorl short of full size.

***Murex torrefactus insularum* n. subsp.**

Specimens from off Waikiki, Oahu, in 35-50 fms. (Langford), differ from the typical form of *M. torrefactus* Sowb., being relatively larger, with somewhat less complex variceal processes, the second from above nearly as long as the first and receding. *M. rubiginosus* Reeve has a larger aperture, and the second variceal process does not recede.

Length 69, diameter 44 mm.

***Sistrum vitiense* n. sp.**

Viti Islands, A. J. Garrett. Type and paratypes no. 36732 A. N. S. P.

The shell is stout, ovately fusiform, solid, with straightly conic spire. The ground color is buff-yellow. It is rather weakly plicate longitudinally, with about seven low spiral cords, which are enlarged to form oblong tubercles, from hazel to chestnut-brown in color where they pass over the folds. The tubercles of the series below the suture are lower than the others and separated from the next series by a wider space. Between the tuberculose girdles there

are two or three low cords in each space, all being slightly irregular. The rather prominent siphonal fasciole is apricot-orange colored.

The aperture is white; outer lip having a series of five or six teeth within, the upper and lower ones slightly larger. The columella is straight, having several short, rather strong transverse folds below the middle.

Length 22.5, diameter 14 mm.

It is related to *S. concatenatum* (Lam.), but it is a more compact shell with smaller white aperture, and much less coarse sculpture.

**Cymatium** species.

*Cymatium intermedium* (Pease) is the most abundant Triton in Oahu. *C. chlorostoma* (Lam.) is found in Honolulu Harbor, Hilo and other places. *C. tuberosum* Lam. is not uncommon on reefs.

*C. vestitum* Hinds<sup>9</sup> is represented by a race in which the tooth intervals are carnelian red or rufous, the form more slender, and the few intervariceal ribs are very weak. Length 74, diameter 34mm. This race may be called *C. vestitum insulare*. Type no. 35279 A. N. S. P.

The finest specimen I have seen is in the collection of Irwin Spalding.

**Strombus ostergaardi** n. sp. Pl. XII, figs. 27, 28.

The shell is somewhat pear-shaped, rather solid, white in the only examples known, which are long-dead shells.

The rather short spire is concavely conic. In the most perfect example the penult whorl is weakly angular above the suture, with very weak, coarse nodes; the next earlier whorl is distinctly angular and tuberculate; above this the tubercles become closer, longer, so that the next two whorls are costate. The conic summit, of about 3 convex whorls, is smooth. The last whorl is very slightly compressed between face and back. It is slightly swollen behind the outer lip, somewhat flattened preceding the swelling, on the ventral face strongly convex above. It is smooth except for oblique grooves around the lower part and more or less distinct spiral threads near the lip. The suture descends in the last third of a whorl, ascending a little at its termination. The aperture is narrow. Outer lip not excavated posteriorly, having a moderate sinus anteriorly; closely lirate within. The inner lip is thick, with well defined edge, and is regularly lirate throughout.

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<sup>9</sup>Zoology of the Voyage of the Sulphur, II, 1844, p. 11, pl. 4, figs. 1, 2.

Length 24.5, diameter 12 mm.

Length 31, diameter 16 mm.

Honolulu Harbor, from the dredger dump on the Harbor side of Sand Island, J. M. Ostergaard. Also from the Kailua coast, on the north side of Oahu, W. A. Bryan.

This species is less distorted than *S. gibberulus* L., with a lirate columellar callus, and no excavation of the outer lip posteriorly. *S. bulbulus* Sowb. is more closely related, but it has a smooth, thinner and less extended columellar callus, and smooth, convex whorls of the spire.

While the specimens have the appearance of fossils, it is likely that the species is still to be found living. The single one before me from Kailua is 21.3 mm. long, and has the short spiral threads over the swelling behind the lip more distinct.

In the largest specimen there seems to be but one nodulose intermediate whorl of the spire, the whorls having the usual impressed spiral line below the suture; but as the spire is quite short, the nodules may be concealed by the enveloping whorls. The sculpture of the spire described above is therefore not a constant feature.

This stromb was first found by Mr. Ostergaard in 1905. Subsequently he found three more.

**Rissoina striatula hawaiiensis** n. subsp.

Differ from *R. striatula* Pease<sup>10</sup> by the constantly smaller size.

Length 4.5 mm.

Length 5.2, diameter .2 mm.; 9 whorls (type).

Length 6.4, diameter 2.7 mm.

Oahu: Paumalu, type loc.; Waimea. Kauai: Haena. All collected by W. A. and E. J. Bryan.

*R. striatula* was described from the Paumotu group. Two specimens measure:

Length 8.3, diameter 3.5 mm.

Length 8.6, diameter 3.4 mm. (Cotype, figured in A. J. C.)

### XIII. PELECYPODS.

**Modiolus matris** n. sp. Pl. XII, fig. 18.

The shell is small oblong wedge-shaped, strongly inflated, thin, bright colored, the prevalent colors being old rose, apricot buff, pieric yel'ow, or white with vinaceous rays; having a thin ye'lowish

<sup>10</sup>Amer. Journ. Conch. III, 1867, p. 296, pl. 24, fig. 31.



cuticle, in large part deciduous, chiefly preserved near the posterior end, and bearing very delicate raised concentric striae. Beaks are rather prominent. The hinge-line is short, slightly curved under the beaks. Internal margins smooth. The interior is colored like the outside but usually brighter in tone.

Greatest length 12.5, greatest breadth 6.5, diameter 6.5 mm.

Greatest length 12.8, greatest breadth 8, diameter 7 mm.

There is considerable variation in contour. The largest valve seen, from Moomumi, Molokai, measures, length 19.3, width 10.2, semidiameter 4.8 mm.

Oahu; Rabbit Island; Paumalu; Mokapu Point (type loc.), Honolulu Harbor. Molokai: Moomomi. Pukahaku. Midway Island. Pearl and Hermes Reef (W. A. and E. J. Bryan).

**Modiolus peasei** Newcomb.

1870. Amer. Journ. Conch. V, p. 163, pl. 17, fig. 7. ("Sandwich Islands, dredged in 12 fms., outer harbor of Honolulu").

Off Honolulu in 6 fathoms, D. B. Langford, 1915; Off Mala Bay, West Maui, 21 fathoms, Thaanum and Langford, 1918. From the second locality there are very fine specimens, up to 31 mm. long.

**Mytilus crebristriatus** Conrad.

1837. Conrad, Journ. Acad. Nat. Sci. Phila. VII, p. 242.

1916. Bryan, Nat. Hist. of Hawaii, p. 457, pl. 104, fig. 1.

Oahu: Honolulu Harbor; Pearl Harbor. Molokai: Kainalu. Hawaii: Hilo.

The large typical form of this species is particularly abundant in Pearl Harbor and the adjacent fossil deposits. In Honolulu it occurs on the Kewalo reef, off the mud flats where considerable fresh water comes in, and *Melania mauiensis* is abundant. Probably typical *M. crebristriatus* occurs only where the salt water is slightly diluted with fresh; on open shores it is replaced by a small form.

The usual length of *M. crebristriatus* is from 25 to 35 mm. So far as we know, the only published figure is that in Bryan's Natural History of Hawaii.

A very thick form was found fossil at Waimanalo, Oahu, by Prof. Bryan.

On most of the open beaches a small form, which may be called form *maritima*, is found in abundance; the length is 10 to 15 mm. Localities for this form follow, mainly from the Bryan collection.

Ocean Island. Mokumanu. Kauai: Hanalei, Haena, Milolii, Kalalau. Oahu: Honolulu Harbor, Mokapu Point, Kailua, Paumalu, Waimanalo, Kaneohe Bay, Laie. Molokai: Moomomi, Kainalu, Papohaku. Maui: Maalaea Bay, Kahului. Hawaii: Hilo.

At Kainalu, Molokai, a set was taken having the shell very thin and frail, the corrugation weakly developed. Length 17 mm.

**Congerina bryanae** n. sp.

The shell is triangular, very much inflated along the middle of its length, the ventral side flattened and subtruncate, the posterior and dorsal borders, beyond the hinge, broadly rounded. Sculpture of very numerous radial riblets crossed by closer and narrower concentric threads which are more prominent in the intervals. The color is green or yellow, uniform or clouded in varying shades and tints, often with some irregular, maculation of brown, or whitish and pale yellow with vinaceous or pink maculation. The interior is whitish, more or less tinted with the external colors. The septum is small, There are about 10 rather strong teeth in each valve, between beaks and septum, and a group of elongated crenulations at the posterior end of the hinge-line. The rest of the internal margin is delicately crenulate.

Length 6.5, width 4.3, diameter 5 mm.

Length 11.2, width 6.6, diameter 6 mm.

Oahu: Mokapu Point, Kailua, Paumalu, Rabbit Island (type loc.), Makapuu Point, Honolulu Harbor. Kauai: Mouth of Hanalei River. Molokai: Moomomi. Laysan Island. Pearl and Hermes Reef (W. A. and E. J. Bryan).

*Mytilus bifurcatus* Conrad, said to be from the Sandwich Islands, is a common Californian species. See Nautilus XII, Oct., 1898, p. 69.

**Cardium thaanumi** n. sp. Pl. XII, fig. 24.

The shell is small, plump, thin. Beaks full, slightly inclined forward, nearly smooth; posterior end truncate, anterior rounded. White with the beaks and numerous rays of a light coral red color; the rays faint except towards the periphery.

Sculpture of many very fine, even radial striae, which are closely, minutely prickly towards the periphery and ends. Hinge-teeth well developed; inner margin crenulated.

Length 11, height 10.5, diameter 9 mm.

Off Waikiki, Oahu, 35 to 50 fathoms. Also off Launiupoko Camp, near Lahaina, West Maui 4 to 8 fathoms, Tha anum and Langford.



Two other species of *Cardium* are not uncommon, the large *Cardium orbita* B. and S., Hilo, Hawaii (Thaanum); Moomomi, Molokai, Haena, Kauai (Bryan), and *C. arcuatulum* Sowerby, a very small, angular *Fragum*, from Hilo, Hawaii (Thaanum); Honolulu (Bryan), and Haleiwa (Pilsbry), Oahu.

***Solecardia bryani*** n. sp. Fig. 5.

The shell is thin, oval, somewhat inequilateral, moderately plump, white. Upper and lower margins subequally curved; anterior end narrower than the posterior, both being rounded. Except the beaks, the surface is minutely densely punctate, more coarsely so near the ends; the points arranged in radial lines on the dorsal posterior slope, elsewhere irregularly or in indistinct zigzags. Right valve having a slender, erect, cardinal and a low, elongate posterior tooth.

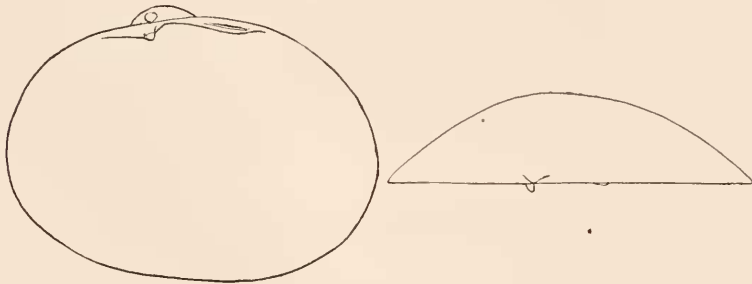


Fig. 5.—*Solecardia bryani*, n. sp., interior and dorsal view of right valve.

Length 10.8, altitude, 7.8, diameter 5.2 mm.

Oahu: Paumalu, W. A. and E. L. Bryan.

***Solecardia hawaiiensis*** n. sp. Fig. 6, a, b, c.

The shell is thin, white, oblong, moderately plump, inequilateral. Dorsal margin arched, a little more curved than the basal; anterior end vertically subtruncate, anterior end rounded. Beaks very small with more convex, orbicular embryonic caps. Surface glossy, with fine growth lines only. Interior dull, the muscle impressions and pallial line rather indistinct. Right valve with a strong, erect anterior tooth and an elongate, lower posterior. Left valve has strong median, weak anterior and elongate posterior tooth.

Length 7, altitude 4.8, diameter 3.4 mm.

Hawaii: Hilo, Thaanum, type loc. Kahoolawe, on the north shore (Pilsbry). Molokai: Kainalu and Moomomi (Bryan). Oahu: Honolulu Harbor and Paumalu (Bryan), near Kahuku and Haleiwa

(Pilsbry). Kauai: Hanalei river (Bryan). Laysan Island (Capt. Brown).

Near the figure of *Scintilla deshayesi* Sowb., but more elongate, not so abrupt posteriorly. *Erycina ovata* Gld.<sup>11</sup> is less inequilateral, and the anterior truncation is a little oblique. The teeth, too, appear to differ, if Gould's figure is correct.

***Solecardia hawaiiensis obesior* n. sub.p.** Fig. 6, d, e.

Similar to *S. hawaiiensis*, but plumper, shorter, with wider beaks. Length 7, altitude 5.3, diameter 4.7 mm.

Honolulu Harbor (W. A. and E. L. Bryan).

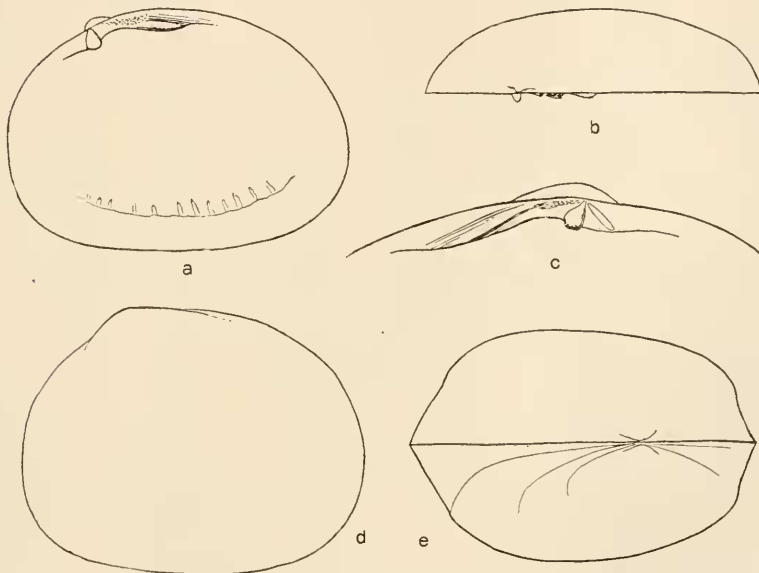


Fig. 6.—*a, b*, *Solecardia hawaiiensis*, interior and dorsal views of right valve; *c*, hinge of left valve. *d, e*, *Solecardia hawaiiensis obesior*, lateral and dorsal views.

***Solecardia stigmatica* n. sp.** Fig. 7

The shell is very thin, fragile, somewhat ovate, the anterior end narrower, posterior end broadly rounded, rather compressed, white, with a median radial russet band, fading at the edges and below. Surface glossy, marked with faint growth lines. Interior dull. Right valve having a slender, erect cardinal tooth. Left valve with an elongate, lower one.

<sup>11</sup>U. S. Expl. Exped. Mollusca, p. 401, pl. 44, figs. 387-387b. Sandwich Islands.

Length 5.3, altitude 3.5, diameter 1.8 mm.

Hilo, Hawaii, D. Thaanum.

Easily known by the rich brown stripe.

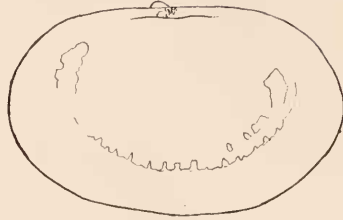
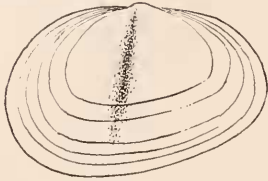


Fig. 7.—*Solecardia stigmatica* n. sp.

Fig. 8.—*Solecardia thaanumi*, n. sp.

***Solecardia (Scintilla) thaanumi*** n. sp. Fig. 8.

The shell is white, oblong, the basal margin slightly more curved than the upper, not gaping; ends rounded, the anterior slightly shorter; compressed, slightly inequilateral. Beaks very small, capped with minute, orbicular embryonic valves. Surface with faint growth lines. Interior dull, minutely vermiculate with white on a grayish ground outside of the pallial line, which is distinct and irregular. Cardinal tooth of right valve very low, indistinct.

Length 6.75, altitude 4.25, diameter 2.4 mm.

Hawaii: Hilo, D. Thaanum.

***Solecardia (Scintilla) chascax*** n. sp. Fig. 9.

The shell is very thin, fragile, compressed, oblong, subequilateral, broadly gaping below; whitish, translucent. Hinge margin straight;

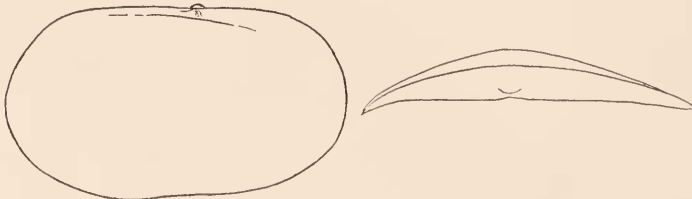
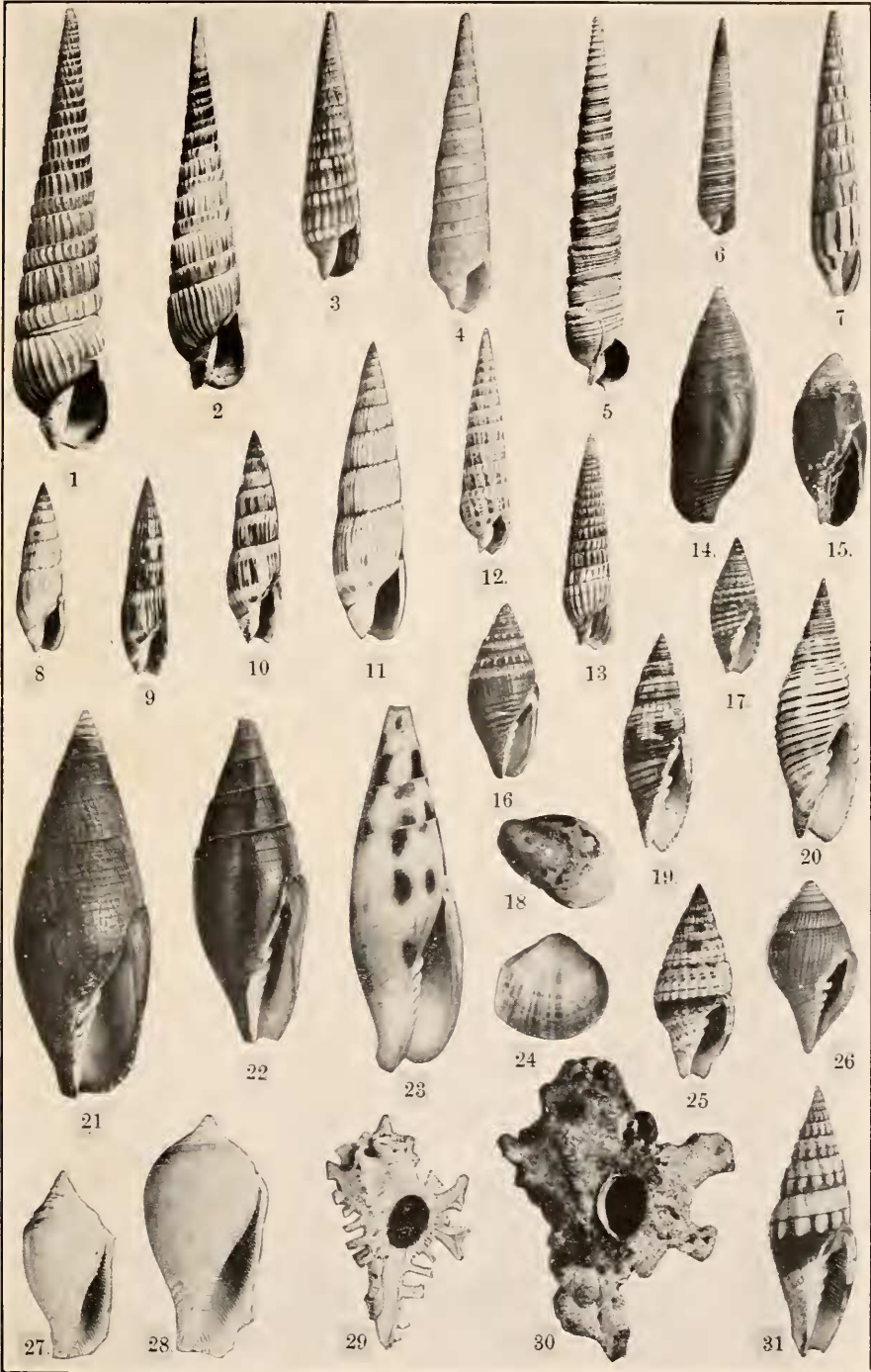


Fig. 9.—*Solecardia chascax*, interior and ventral views.

basal margin straightened in the middle, then somewhat dilated anteriorly; ends rounded. Beaks very small. Both valves have a very low, indistinct cardinal nodule but no other teeth.

Length 6.9, altitude 3.8, diameter 2 mm.

Hawaii: Hilo, D. Thaanum.



PILSBRY: MARINE MOLLUSKS OF HAWAII, VIII-XIII.

